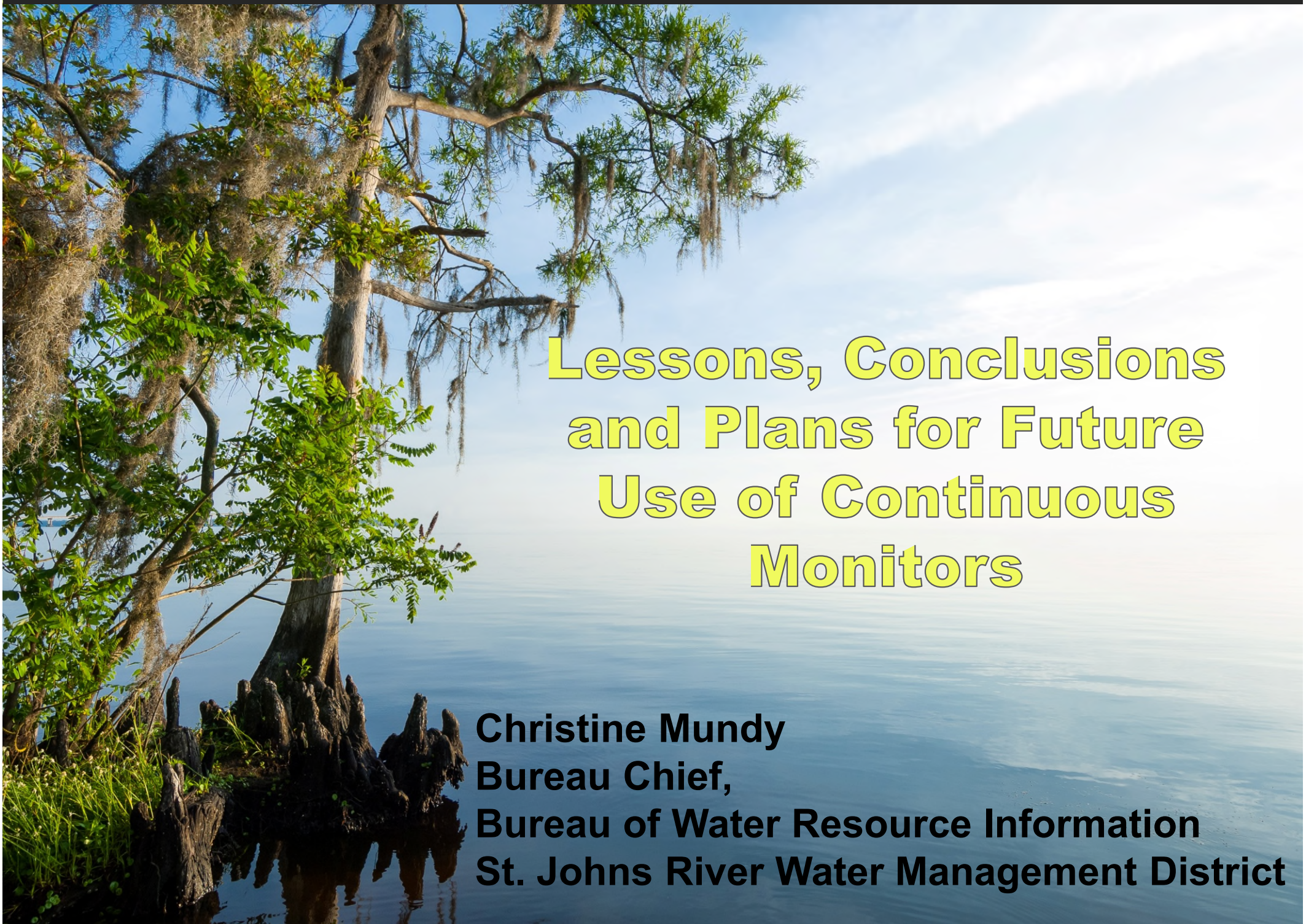
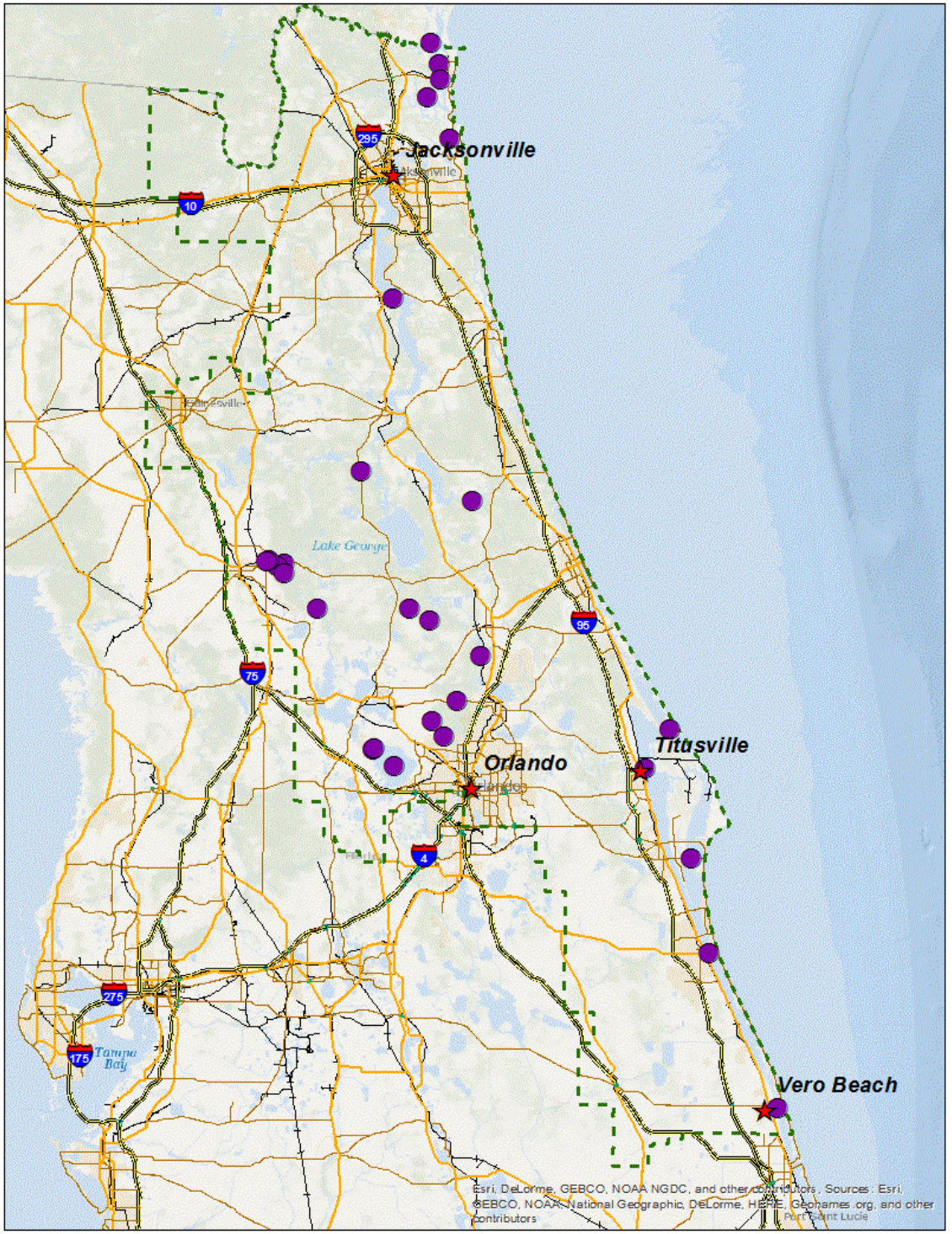


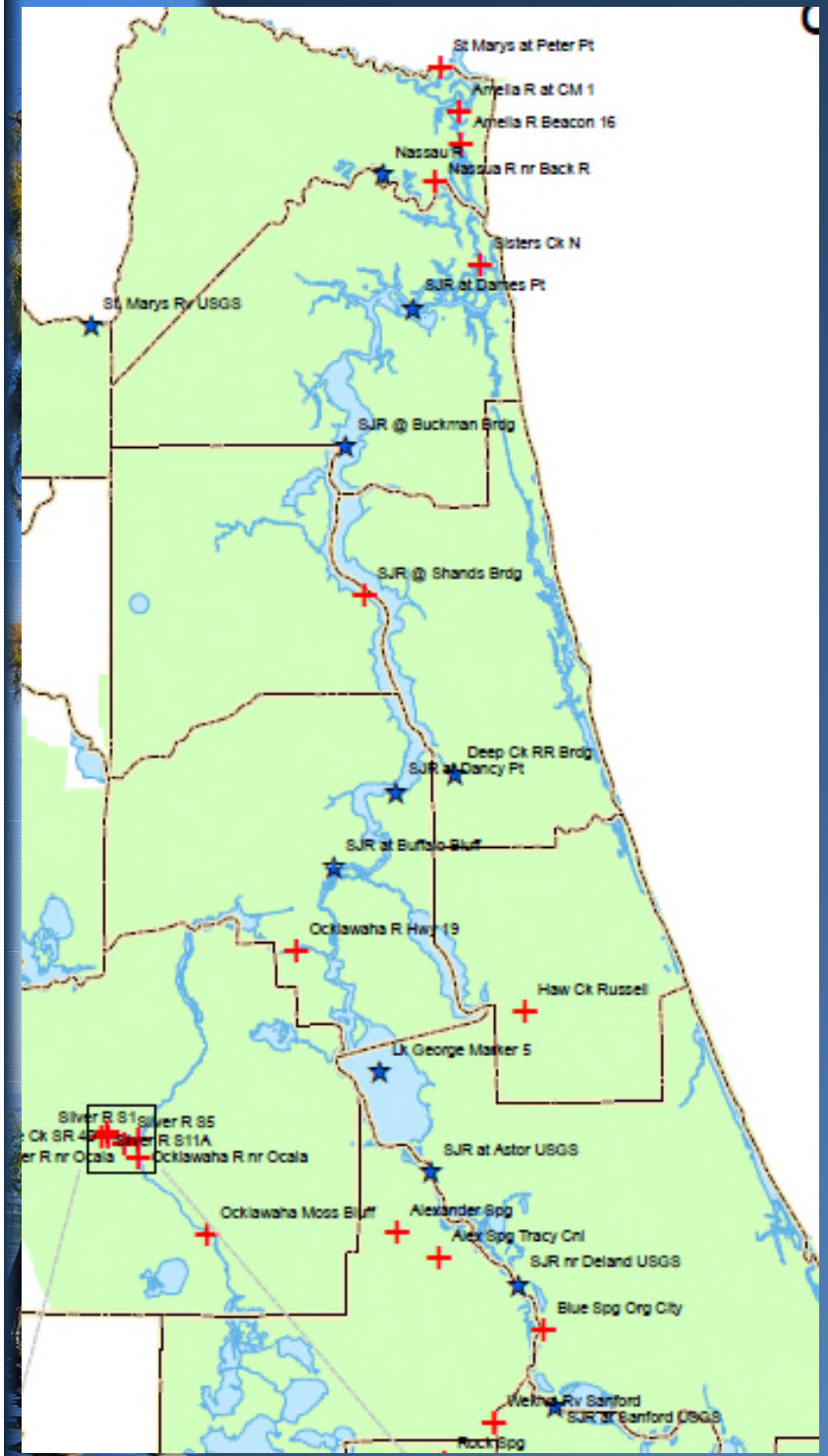
Lessons, Conclusions and Plans for Future Use of Continuous Monitors

Christine Mundy
Bureau Chief,
Bureau of Water Resource Information
St. Johns River Water Management District



CM Network Recap

- Initial installs, Indian River Lagoon system
- Growth over time



CM Network Recap

- Cooperative sites with USGS

CM Network Recap - Costs

Initial equipment cost (SJRWMD only)	$491,000 +
Service frequency	12-20 visits per site per year
Total estimated O&M costs FY16, 29 sites	$113,500
Total FY16 cost, 20 USGS co-op sites	$227,440

CM Network Recap - Costs

- Other costs:
  - Quality Assurance staff time
  - Telemetry
  - Software
  - IT support, web sites

CM Network Recap - Challenges

- Maintenance challenges
- QA/QC challenges
- Accounting for true costs difficult

Lessons

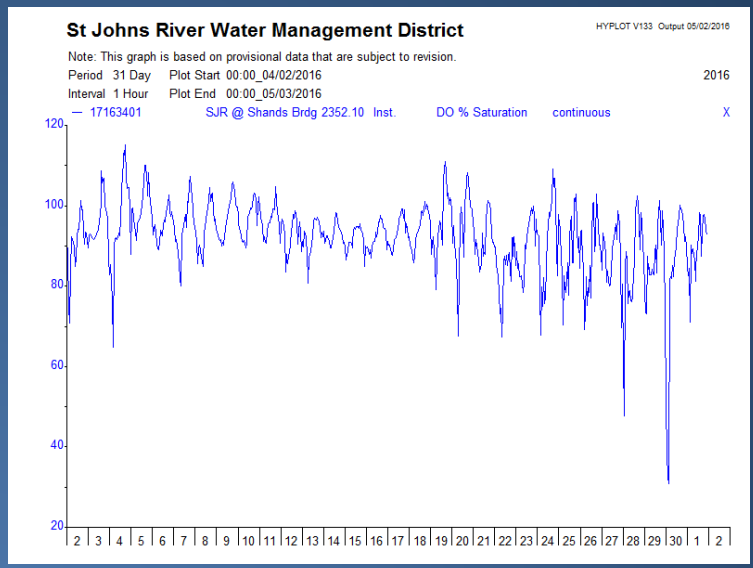
- Ongoing evolution of
  - Instrumentation
    - Sensor capabilities
    - Durability
  - Methodologies, QA SOPs
  - Data dissemination

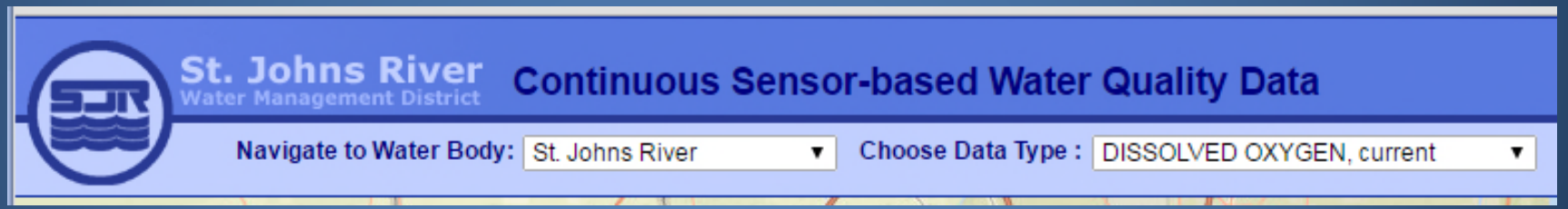
Lessons – Data management

- Time series: atypical water quality data
  - Transfer and storage
  - Quality assurance
  - Analysis tools

Lessons – Data dissemination

- Additional Cost: enabling public access

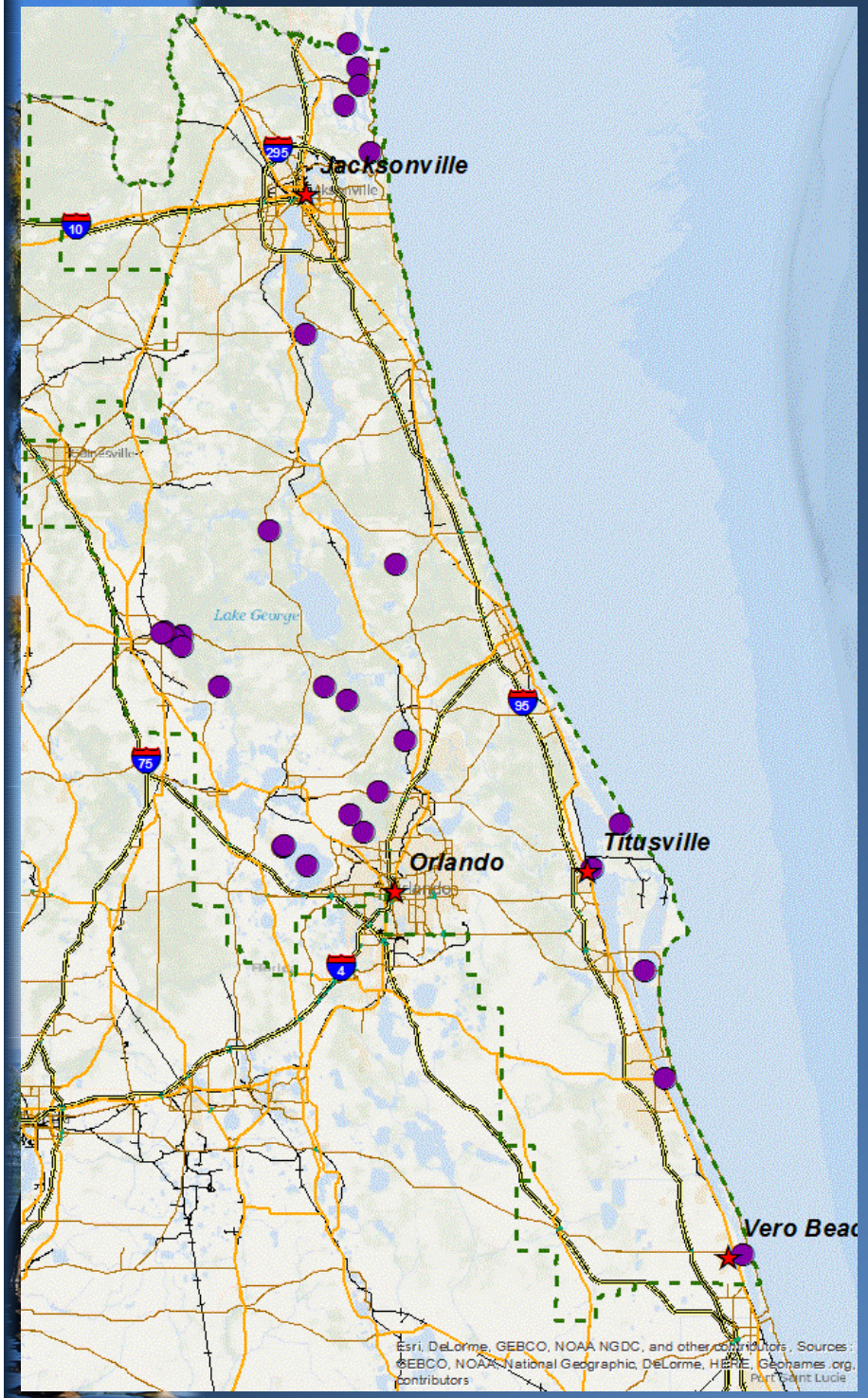




http://webapub.sjrwmd.com/agws10/hdswq/

Changing priorities

- Greater awareness of costs
- Curb growth, fine tune focus



Future plans

- Core long term sites …
  - Main stem St. Johns River
  - Indian River Lagoon system
  - Outstanding Florida Springs
- … plus mobile short-term sites
  - Project driven

Future plans

- Continue to build and implement QA methodologies
- Florida Water Resources Monitoring Council
  - CM workgroup: develop and share protocols, SOPs, etc.

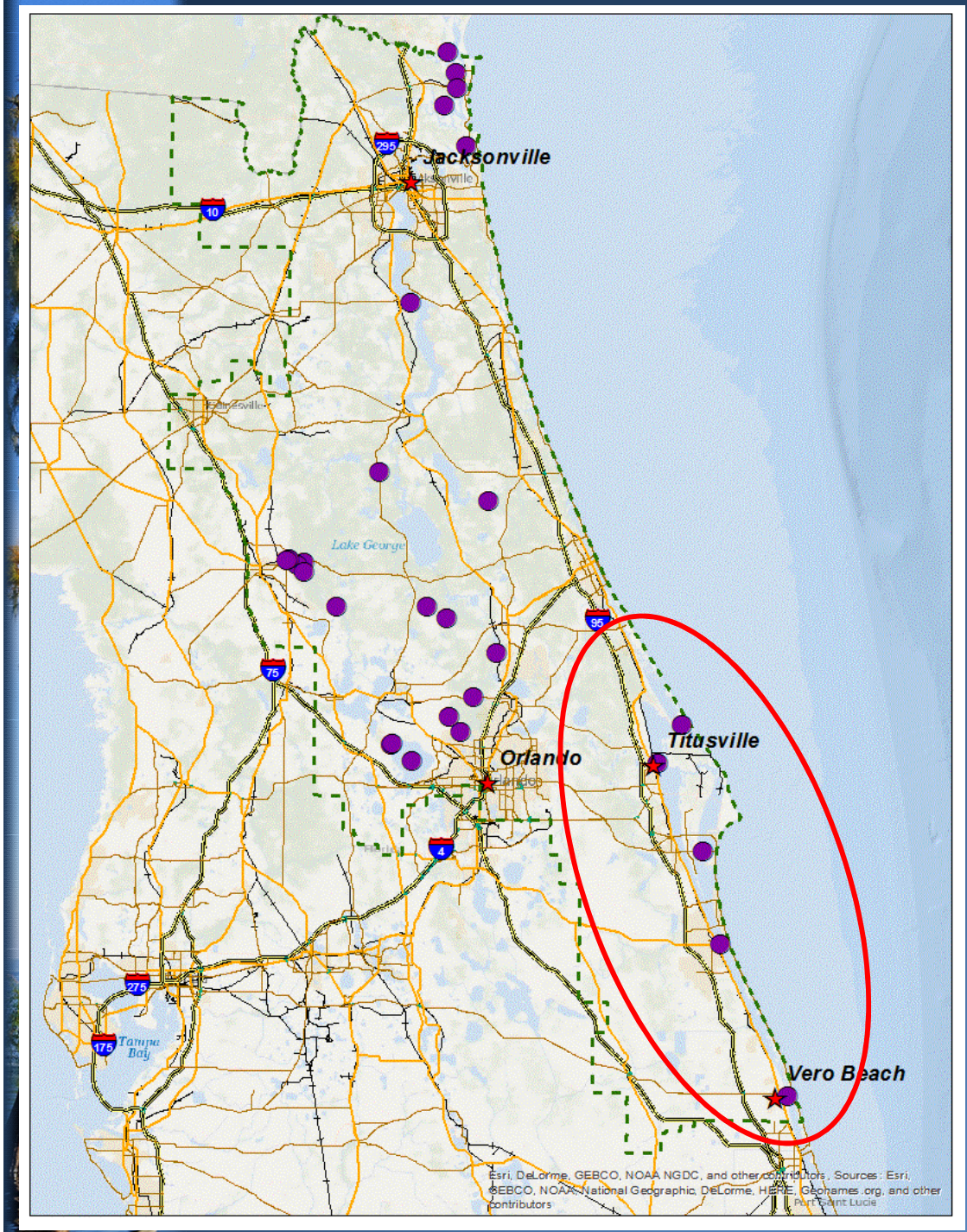
Panel L8, Thursday 4:00, Room 24

Future plans

- Improve data access
  - Open Geospatial Consortium Sensor Observation Service

http://www.opengeospatial.org/standards/sos

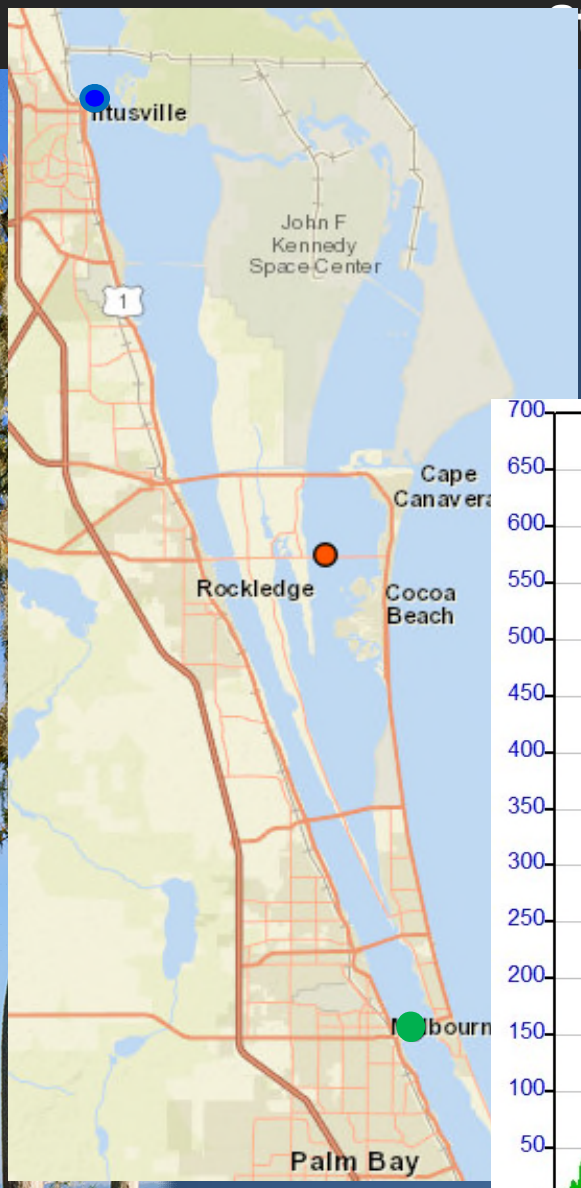
Powerful insight and communication tool ...

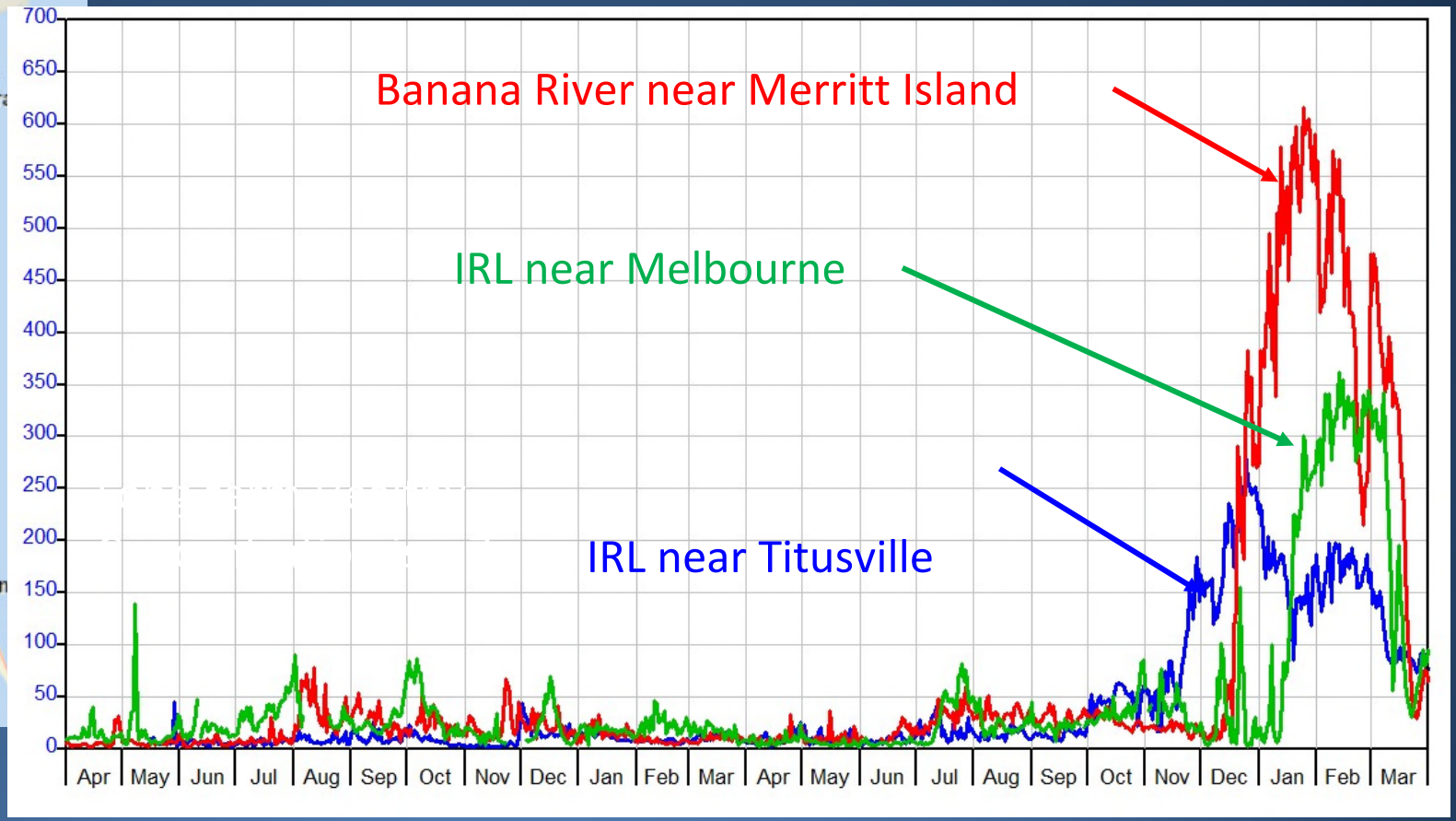


Continuous water quality monitoring, Indian River Lagoon

http://webapub.sjrwmd.com/agws10/hdswq/

Chlorophyll (µg/L)
April 2014 – March 2016

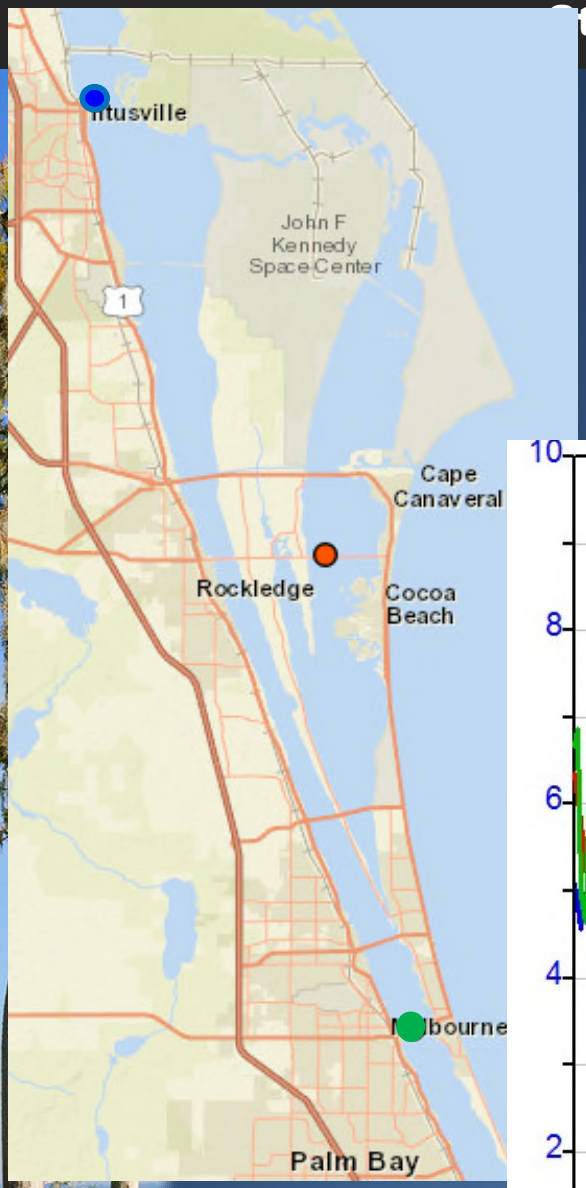


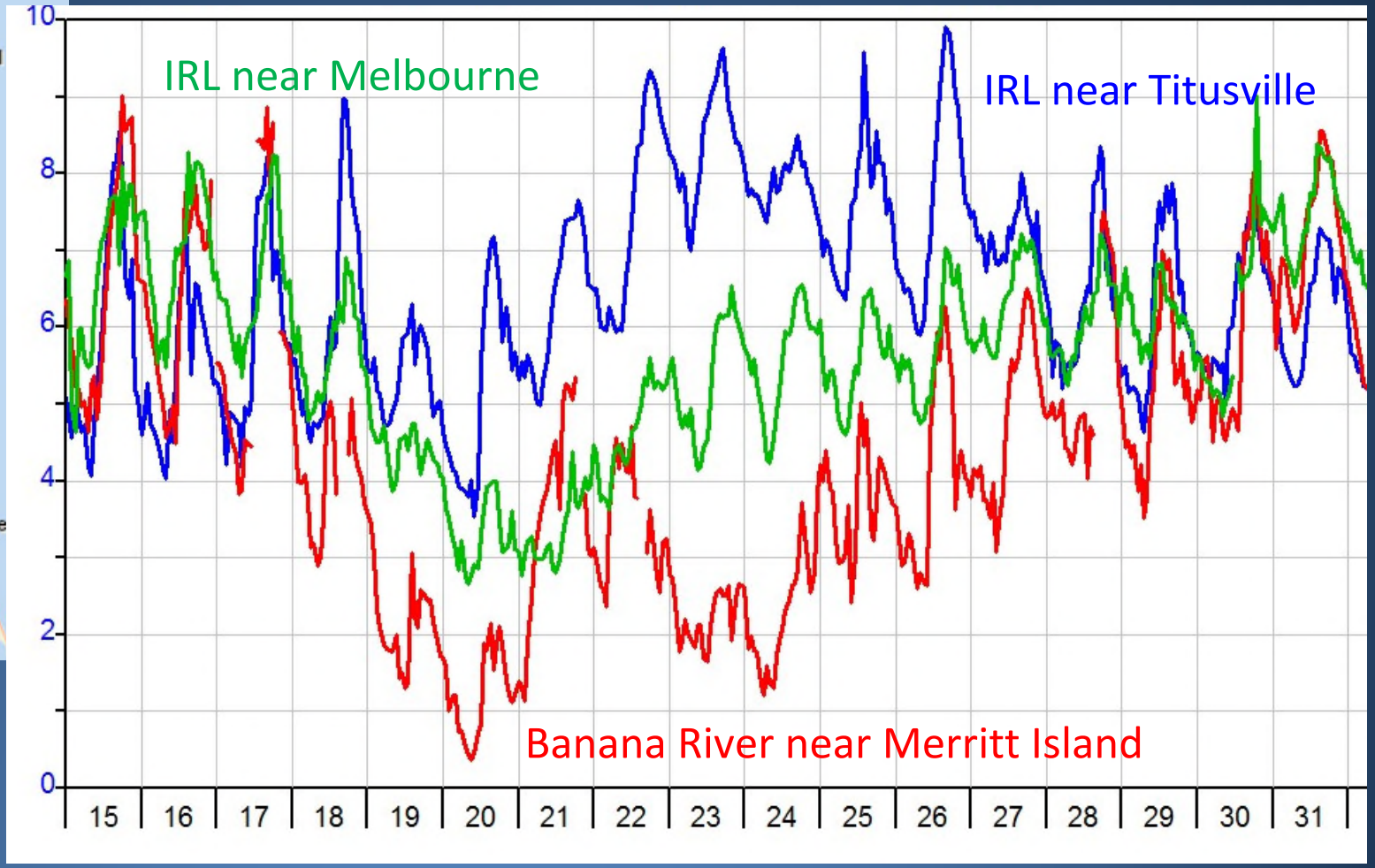


April 2014 | 2015 | 2016

Chlorophyll values as measured by the continuous monitoring sensor are reliably calibrated only at concentrations less than 63 µg/L. Measurements above the calibration maximum should only be used for relative comparisons, not as absolute values.

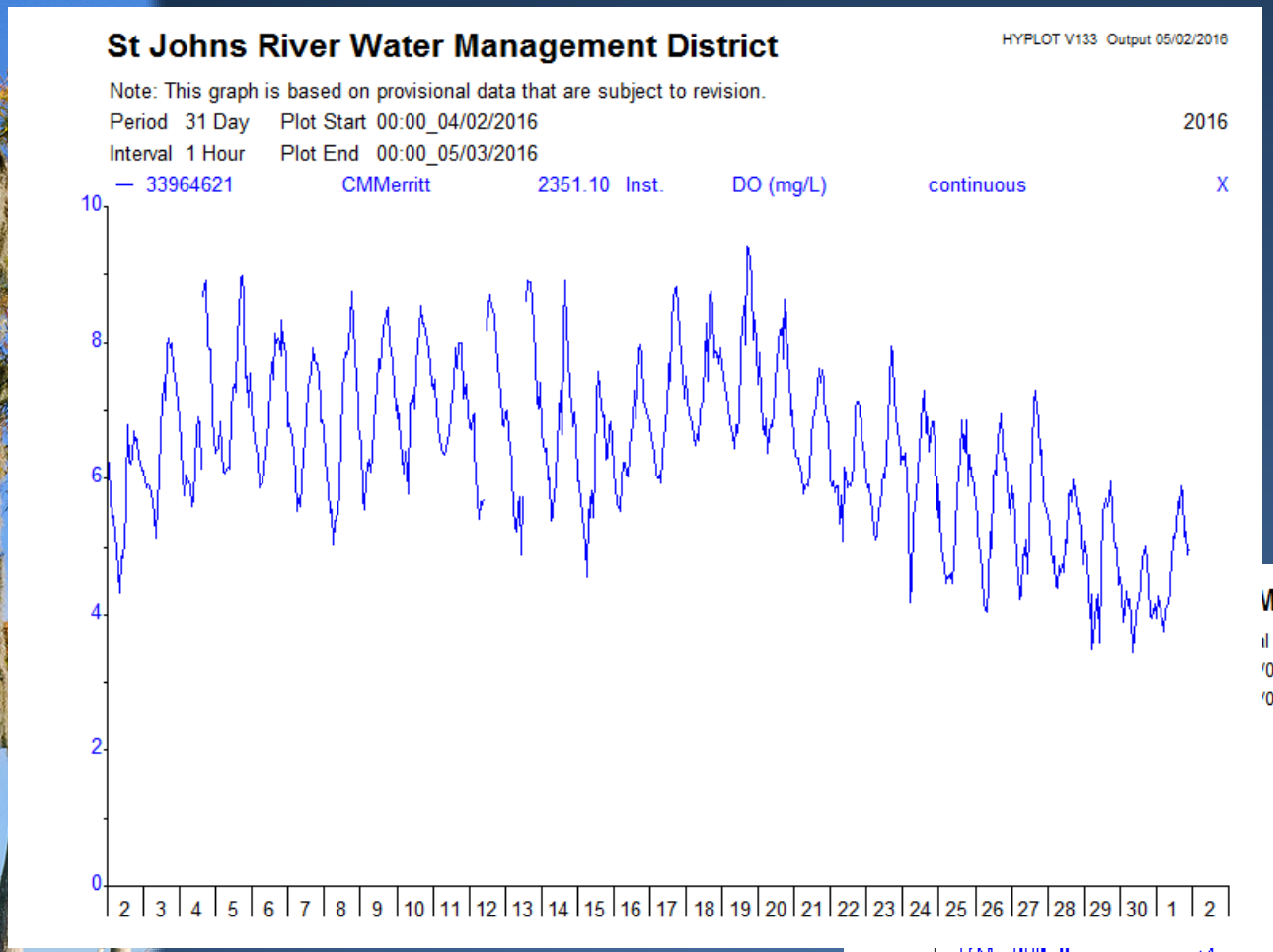
Dissolved Oxygen (mg/L)
March 15 - March 31, 2016

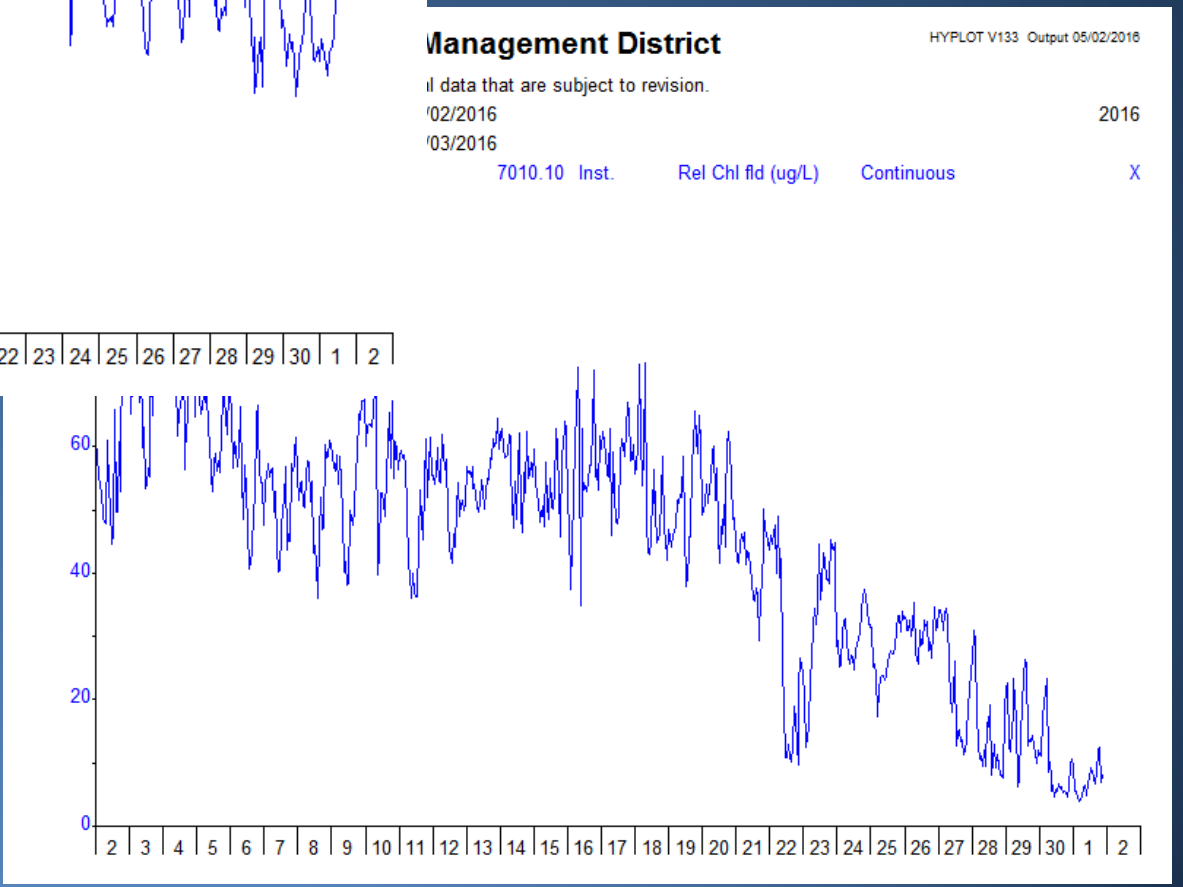




March 2016

St. Johns River Water Management District

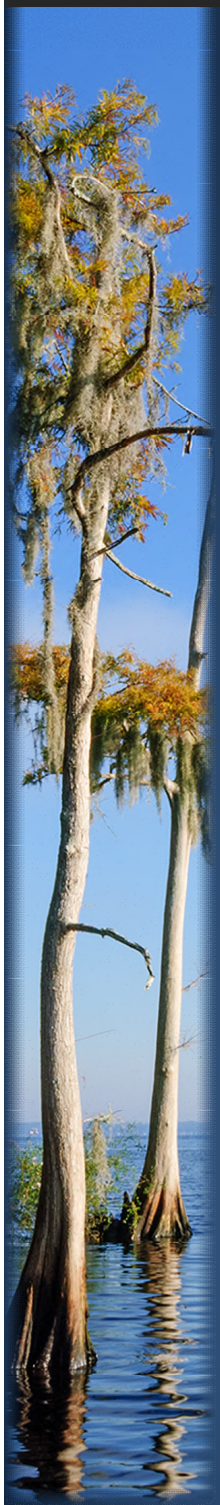




Reference

Pellerin, Brian A., Beth A. Stauffer, Dwane A. Young, Daniel J. Sullivan, Suzanne B. Bricker, Mark R. Walbridge, Gerard A. Clyde, Jr., and Denice M. Shaw, 2016. **Emerging Tools for Continuous Nutrient Monitoring Networks: Sensors Advancing Science and Water Resources Protection.** Journal of the American Water Resources Association (JAWRA) 1–16. DOI: 10.1111/1752-1688.12386

Paper No. JAWRA-15-0091-P of the Journal of the American Water Resources Association(JAWRA).



Questions

- Examples of other approaches:
  - Ocean Research and Conservation Association, http://www.teamorca.org/

    http://www.teamorca.org/cfiles/why_monitor.cfm

  - Harbor Branch, Florida Atlantic University

    http://fau.loboviz.com/